

## CLAIMS

1. An electrode for discharge surface treatment used for a discharge surface treatment of generating an electrical discharge between the electrode and a treatment target material and forming a hard coat on a surface of said treatment target material, wherein

at least one hard matter having electrical insulating property and at least one matter having electrical conducting property are included as materials of said electrode.

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2. The electrode according to claim 1, wherein said hard matter is at least one of cBN, diamond,  $B_4C$ ,  $Al_2O_3$ ,  $Si_3N_4$  and SiC.

15 3. The electrode according to claim 1, wherein said matter having electrical conducting property is at least one of metals forming a hard carbide such as Ti, W, Mo, Zr, Ta and Cr or at least one of iron-group metals such as Co, Ni and Fe.

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4. A method of manufacturing an electrode for discharge surface treatment of generating an electric discharge between the electrode and a treatment target material and forming a hard coat on a surface of the treatment target material utilizing the energy radiated during the electrical

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discharge, wherein

said electrode is formed by mixing powder of a hard matter having electrical insulating property with powder of a matter having electrical conducting property and  
5 compression-molding resultant powder mixture.

5. A method of manufacturing an electrode for discharge surface treatment of generating an electric discharge between the electrode and a treatment target material and  
10 forming a hard coat on a surface of the treatment target material utilizing the energy radiated during the electrical discharge, wherein

said electrode is formed by conducting a heat treatment after mixing powder of a hard matter having electrical  
15 insulating property with powder of a matter having electrical conducting property and compression-molding resultant powder mixture.

6. The method according to claim 5, wherein said electrode  
20 is formed by adding wax to materials of said electrode, then compression-molding the material added with the wax, heating the compression-molded material at a temperature not less than a temperature of melting said wax and not more than a temperature of decomposing said wax to generate soot, and  
25 evaporating and removing said wax.

7. A method of manufacturing an electrode for discharge surface treatment according to the present invention provides an electrode to be used for a discharge surface treatment of generating an electric discharge between the electrode and a treatment target material and forming a hard coat on a surface of the treatment target material utilizing the energy radiated during the electrical discharge, wherein  
saidelectrode is formed by compression-molding powder  
10 obtained by coating powder of a hard matter having electrical insulating property with a matter having electrical conducting property or powder obtained by adding another powder material to the powder of the hard matter having electrical insulating property coated with the matter having  
15 electrical conducting property.

8. A method of manufacturing an electrode for discharge surface treatment according to the present invention provides an electrode to be used for a discharge surface treatment of generating an electric discharge between the electrode and a treatment target material and forming a hard coat on a surface of the treatment target material utilizing the energy radiated during the electrical discharge, wherein  
saidelectrode is formed by conducting a heat treatment  
25 after compression-molding powder obtained by coating powder

of a hard matter having electrical insulating property with  
a matter having electrical conducting property or powder  
obtained by adding another powder material to the powder  
of the hard matter having electrical insulating property  
5 coated with the matter having electrical conducting  
property.

9. The method according to claim 8, wherein said electrode  
is formed by adding wax to material of said electrode, then  
10 compression-molding the material added with the wax, heating  
the compression-molded material at a temperature not less  
than a temperature of melting said wax and not more than  
a temperature of decomposing said wax to generate soot, and  
evaporating and removing said wax.

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10. A discharge surface treatment method of generating  
an electric discharge between an electrode for discharge  
surface treatment and a treatment target material and forming  
a hard coat on a surface of said treatment target material  
20 utilizing the energy radiated during the electrical  
discharge, wherein

said electrode includes at least one hard matter having  
electrical insulating property and at least one matter having  
electrical conducting property.

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11. The discharge surface treatment method according to claim 10, wherein said hard matter is at least one of cBN, diamond,  $B_4C$ ,  $Al_2O_3$ ,  $Si_3N_4$  and SiC.

- 5 12. The discharge surface treatment method according to claim 10, wherein said matter having electrical conducting property is at least one of metals forming a hard carbide such as Ti, W, Mo, Zr, Ta and Cr or at least one of iron-group metals such as Co, Ni and Fe.